

### **REMARKS**

The Applicant wishes to thank the Examiner for the time spent telephonically discussing the case with the Applicant's representative. The Applicant believes the claims are now in condition for allowance. The amendments involve adding matter from already-examined dependent claims into already-examined independent claims; and, this response is being made by the two month date after the final rejection. Accordingly, the Applicant respectfully requests entry of the amendment and reconsideration of the Examiner's previous rejections.

Claims 2-11, 15, and 17 remain in this application. The Applicant hereby cancels Claim 1 in response to the restriction requirement. The Applicant also hereby cancels Claims 12, 13, 14, and 16. The Applicant reserves the right to pursue in a continuing application the subject matter not sought in the present application.

The Applicant has amended independent Claims 2, 7, 10, and 15 to specify that the buffered electrodeposition bath also comprises potassium biphthalate and sulphamic acid. Support for the amendment may be found in, *inter alia*, dependent Claims 12, 13, 14, and 16, now cancelled.

#### **Rejections Under 35 USC §103**

9. The Examiner had rejected Claims 2-9, 15, and 17 under 35 USC 103(a) as obvious over U.S. Patent No. 5,730,852 ("Bhattacharya") in view of Lowenheim. This rejection is rendered moot by the present amendment since neither of the cited references, alone or in combination, disclose or render obvious, *inter alia*, a buffered electrodeposition bath comprising potassium biphthalate and sulphamic acid, as discussed in Point 11 below. Accordingly, the Applicant respectfully requests reconsideration and withdrawal of this rejection.

10. The Examiner had rejected Claims 10 and 11 under 35 USC 103(a) as obvious over Bhattacharya in view of Lowenheim, U.S. Patent No. 5,141,564 ("Chen"), and U.S. Patent No. 4,686,323 ("Biter"). This rejection also is rendered moot by the present

amendment since none of the cited references, alone or in combination, disclose or render obvious, *inter alia*, a buffered electrodeposition bath comprising potassium biphthalate and sulphamic acid, as discussed in Point 11 below. Accordingly, the Applicant respectfully requests reconsideration and withdrawal of this rejection.

11. The Examiner had rejected Claims 12, 13 and 16 under 35 USC 103(a) as obvious over Bhattacharya and Lowenheim as applied to claims 2-9, 15, and 17, and further in view of Liang and Kegeles. To establish a prima facie case of obviousness, there must be, among other things, a reasonable expectation of success found in the cited art.<sup>1</sup> To find a reasonable expectation of success, the cited art must be considered in its entirety, including portions that would lead away from the claimed invention.<sup>2</sup> A teaching away in the cited art is a significant factor in determining obviousness.<sup>3</sup>

When high voltages are applied to the aqueous solution, OH<sup>-</sup> and/or O<sup>2-</sup> ions generated by the electrolysis of water react with the metal ions to form metal oxides.<sup>4</sup> These metal oxides are contaminants that reduce the efficiency of a resulting photovoltaic cell and may interfere with the consistent and uniform deposition of gallium.<sup>5</sup> However, the potassium biphthalate and sulphamic acid stabilize the chemical bath by reacting with the ions freed during electrolysis.<sup>6</sup> The result is a more efficient photovoltaic cell with a relatively uniform layer of gallium. The cited references do not lead a skilled artisan towards a buffered electrodeposition bath comprising potassium biphthalate and sulphamic acid.

Bhattacharya does not teach buffering a solution with potassium biphthalate and sulphamic acid to overcome the metal oxide/uneven gallium layer disadvantages. Indeed, Bhattacharya advocates partially or completely replacing the water in the

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<sup>1</sup> MPEP 2143.02.

<sup>2</sup> MPEP 2141.02 (VI).

<sup>3</sup> MPEP 2145 (X)(D)(1).

<sup>4</sup> Specification, p. 7, ¶ 0026.

<sup>5</sup> Specification, p. 7, ¶ 0026.

<sup>6</sup> Specification, p. 7, ¶ 0026.

electroplating solution with one or more organic solvents such as dimethyl sulfoxide.<sup>7</sup> Upon reading the disclosure of Bhattacharya, a skilled artisan would be motivated to replace water, not buffer it using potassium biphthalate and sulphamic acid.

Lowenstein generally teaches that pH control is of minor concern in highly acidic or highly alkaline plating solutions but more important for "neutral" (ph 5-8) solutions where buffering is often necessary.<sup>8</sup> Lowenstein advocates no specific pH ranges and no particular buffers. Accordingly, Lowenstein does not lead the skilled artisan to prepare an electroplating solution having a pH of about 2-3 and buffered with potassium biphthalate and sulphamic acid.

Liang is directed to amine-quinone polyurethanes as binders for metal particle tape.<sup>9</sup> The present invention is directed to the use of potassium biphthalate and sulphamic acid to prevent the formation of metal oxides. The Liang citation to which the Examiner refers actually relates to "Comparative Corrosion Studies".<sup>10</sup> In that section, Liang uses a solution containing potassium biphthalate and sulphamic acid to test the resistance of its metal particle tape to oxidation.<sup>11</sup> In other words, Liang's potassium biphthalate and sulphamic acid containing solution was used to oxidize metal particles, not to prevent the formation of metal oxides. Upon reading Liang, a skilled artisan would be directed away from the claims of the present invention.

Kegeles is directed to the use of radioligands to measure dopamine release in humans. The disclosed radioligands were prepared by radio-iodination of a phenolic precursor with high purity sodium iodide in the presence of potassium biphthalate, sulphamic acid, and 3.2% peracetic acid. An artisan in search of ways to buffer an electroplating solution containing inorganic salts would not seek the teachings of Kegeles, which tangentially discloses a buffer for a solution containing an organic precursor.

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<sup>7</sup> Bhattacharya, col. 4, lns 1-9.

<sup>8</sup> Lowenstein, p. 121, pt 5.

<sup>9</sup> Liang, p. 3649, Title and Abstract.

<sup>10</sup> Liang, p. 3650.

<sup>11</sup> Liang, p. 3650.

Since none of the cited references would lead a skilled artisan towards the present claims, the Applicant respectfully requests reconsideration and withdrawal of this rejection.

12. The Examiner had rejected Claim 14 under 35 USC 103(a) as being unpatentable over Bhattacharya, Lowenheim, Chen, and Biter as applied to claims 10 and 11, and further in view of Liang and Kegeles. As discussed in Point 11 above, the teachings of Bhattacharya, Lowenheim, Liang and Kegeles would not lead a skilled artisan towards the present claims. Neither Chen nor Biter, alone or in combination, remedies the shortcomings of these references.

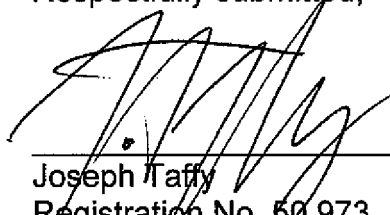
#### **CONCLUSION**

The Applicant respectfully requests reconsideration and withdrawal of all rejections and that a Notice of Allowance be issued for this application. Should any issues remain, the Examiner is invited to contact the Applicant's below-named attorney. Should it be required, the Commissioner is hereby authorized to charge any fee which may be required in connection with this Amendment, or credit any overpayment, to deposit account No. 50-3207.

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Respectfully submitted,

  
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